WHAT IS CLAIMED IS:

1. A linear motor, comprising:

a primary member provided with a first core formed with a magnetic material and having a first facing portion at which a plurality of magnetic teeth face each other and an electromagnetic coil wound thereon, and a second core formed with a magnetic material and having a second facing portion at which a plurality of magnetic teeth face each other and an electromagnetic coil wound thereon; and

a secondary member disposed between magnetic pole teeth of said first and second facing portions and supported so that it can move relatively with respect to said primary member;

wherein the direction of a magnetic flux flow differs between said first facing portion and said second facing portion; and

wherein a conductor is disposed between said magnetic pole teeth adjacent in the moving direction of said secondary member.

2. The linear motor according to claim 1,

wherein said conductor is an electromagnetic coil wound on an axis that is a relative moving direction of said secondary member.

3. The linear motor according to claim 1,

wherein said conductor disposed between said magnetic pole teeth is powered in the opposite direction of the direction of a magnetic flux flow between said magnetic pole teeth.

4. A linear motor, comprising:

a primary member having a core provided with a plurality of magnetic pole teeth and formed with a magnetic material and having an electromagnetic coil disposed thereon, and a secondary member supported through a gap with respect to said magnetic pole teeth such that it can move relative to said primary member,

wherein one of said two magnetic pole teeth arrays in said core is disposed in two steps approximately vertically with respect to the relative movement of said primary member;

wherein the other magnetic pole teeth array in said core is disposed in two steps approximately vertically with respect to the relative movement of said secondary member;

wherein said secondary member is disposed between said magnetic pole teeth in said first step and said magnetic pole teeth in said second step;

wherein said magnetic pole teeth in said first step of one of said two magnetic pole teeth arrays and said magnetic pole teeth in said first step of the other magnetic pole

teeth array are disposed alternately in the relative movement direction of said secondary member;

wherein said magnetic pole teeth in said second step of one of said two magnetic pole teeth arrays and said magnetic pole teeth in said second step of the other magnetic pole teeth array are disposed alternately in the relative movement direction of said secondary member;

wherein said magnetic pole teeth adjacent to each other in the moving direction of said secondary member differ in polarity from each other; and

wherein a conductor is disposed between said magnetic pole teeth adjacent to each other.

5. The linear motor according to claim 4,

wherein said conductor is an electromagnetic coil wound in the relative movement direction of said secondary member.

6. The linear motor according to claim 4,

wherein a current flows in said conductor disposed between said magnetic pole teeth in the opposite direction of that flowing between said magnetic pole teeth.

7. The linear motor according to claim 1,

wherein said secondary member has a permanent magnet or electromagnetic coil; and

wherein one magnetic polarity and the other magnetic polarity appear alternately in the relative movement direction of said secondary member.

8. The linear motor according to claim 1,

wherein said secondary member has a core formed with a magnetic material; and

wherein a magnetic convex portion and a magnetic concave portion appear alternately in the relative movement direction of said secondary member.

9. The linear motor according to claim 1,

wherein said primary member is fixedly supported while said secondary member is movably supported.

10. The linear motor according to claim 1,

wherein said secondary member is fixedly supported while said primary member is movably supported.

11. The linear motor according to claim 1,

wherein said core has an opening approximately vertically in the moving direction of said secondary member.

12. The linear motor according to claim 11,

wherein said secondary member supported so that its center is displaced from the center of said magnetic pole teeth.

13. A method for controlling a linear motor,

wherein said linear motor comprises:

a primary member provided with a first core formed with a magnetic material having a first facing portion at which a plurality of magnetic pole teeth face each other and an electromagnetic coil wound thereon and a second core formed with a magnetic material having a second facing portion at which a plurality of magnetic pole teeth face each other and an electromagnetic coil wound thereon; and

a secondary member disposed between magnetic pole teeth of said first and second facing portions and supported movably with respect to said first member,

wherein the directions of said magnetic flux flow in said first facing portion and said magnetic flux flow in said second facing portion are opposite to each other;

wherein a conductor is disposed between said magnetic pole teeth adjacent to each other in the moving direction of said secondary member; and

wherein said conductor between said magnetic pole teeth is powered to generate a magnetic flux flow in a direction that disturbs the magnetic flux flow between said magnetic pole teeth adjacent to each other.

14. The method according to claim 13,

wherein a current is flown in said conductor disposed between adjacent magnetic pole teeth when said linear motor requires a large thrust force.

15. An XY table provided with an X-axis motor for driving an object to be transferred in the X direction and a Y-axis motor for driving said object to be transferred in the Y direction that is different from said X direction,

wherein said table uses said linear motor described in claim 1 as a driving source of said X- or Y-axis motor.